

NOTE ON A COLLECTION OF SNAKES FROM SOUTH INDIA,
WITH EMPHASIS ON THE SNAKE FAUNA OF THE MEGHAMALAI HILLS
(HIGH WAVY MOUNTAINS)

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This paper deals with two collections of snakes obtained in south India by the senior author in the years 1946-48 and 1949-52 respectively. Specimens were obtained from the Meghamalai Hills, also known as the High Wavy Mountains, from the Anaimalai Hills, located in the State of Tamil Nadu, and in Wayanad district, Kerala, at the northern edge of Nilgiri Hills. A total of 39 snake species are recorded from Meghamalai Hills. This area, now mostly planted with tea, includes Cloudlands, Highways and Manalaar estates, the access to which is now largely restricted, still includes large untouched remnants of evergreen forest. The description of a rare Hutton's Pitviper *Tropidolaemus huttoni* Smith (1949) is completed on the basis of unpublished notes from the senior author.

Keywords: Serpentes, *Tropidolaemus huttoni*, India, High Wavy Mountains, Meghamalai Hills, Tamil Nadu, Anaimalai Hills, Nilgiri Hills, Collection

INTRODUCTION

Hutton (1949a) reported on a collection of snakes obtained in the High Wavy Mountains, south-west of Madurai, in the State of Tamil Nadu, South India (see below for the exact position of this range). Subsequently, Hutton (1949b) described the mammals of this poorly known area. The paper on snakes was based on collections and observations made in 1946-48. This earlier collection contained two specimens of new species of pitviper previously mentioned as a *nomen nudum* by Hutton (1949a), which was later described by Smith (1949a) as *Trimeresurus huttoni*. Since its description, no other specimens have ever been collected. On the basis of the sole holotype, David and Vogel (1998) concluded that this species shares most characters with *Tropidolaemus wagleri* (Boie 1827) and referred it to the genus *Tropidolaemus* Wagler, 1830. Nevertheless, *Tropidolaemus huttoni* remains the most poorly known Hutton's pitviper and one of the rarest of all snake species.

In the present paper, largely on the basis of Angus Hutton's notes, we present a general description of the High Wavy Mts., one of the least known places in south India, as far as zoology is concerned, but now definitely not as remote and forgotten as suggested in David and Vogel (1998). We publish data on specimens of snakes of this second collection. We take this opportunity to present new data on *Tropidolaemus huttoni*.

In contrast to the information published in David and Vogel (1998), the paratype of this species retained by Hutton was not lost but had been donated personally by him in 1962, while on his way to Australia, to Dr. V. Chari, Curator of Reptiles at the Prince of Wales Museum (now Chhatrapati

Shivaji Maharaj Vastu Sangrahalaya [CSMVS]), Bombay (now Mumbai), as instructed by Mr. Humayan Abdulali, the then Honorary Secretary of the Bombay Natural History Society (BNHS), Mumbai. The specimen was sighted in 1973 by Hutton (and his wife), while on a holiday, and he advised the new Curator that the spirit had evaporated and it needed urgent attention. He examined it again in 1986 while on a UN / FAO Consultancy for the GoI and UN, and was disappointed that it had not been attended to!

Although this specimen is in bad condition, it allowed us to expand the variation in this species. On the basis of the 1946-48 and 1949-52 collections, which contain a total of 39 snake species, we tentatively compare the fauna of this isolated range with the known fauna of three other ranges of south India.

MATERIAL AND METHODS

The following list is based on preserved specimens deposited in the Natural History Museum, London in 1952, namely the second collection of the senior author examined by the second author. Some other snakes were deposited in the collection of the BNHS, Mumbai and CSMVS, Mumbai.

The exact localities of collect are as follows:

Anaimalai Hills: Injapara and Monica Tea Estates, Coimbatore district, Tamil Nadu, 1949-51; High Wavy Mts.: Meghamalai Hills, (1946/48) see above; Mysore: Kadamane Estate, near Sakleshpur, Hassan district, Karnataka, 1951; Nilgiri-Wayanad: Rockwood Estate, Wayanad district, Kerala (1952).

Interesting specimens are described in detail below. Biological notes are exclusively based on Angus Hutton's



Fig. 1: Map of South India showing the general position of the Meghamalai Hills. Thick line on the South: general limit of the Meghamalai Hills; Thin line on the North: the Varushanad Hills

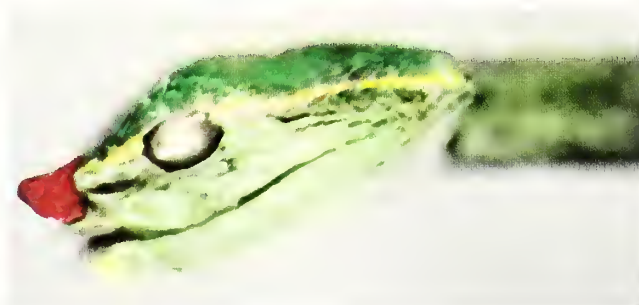


Fig. 2: *Tropidolaemus huttoni* (Smith, 1949), lateral view of the head of the paratype. Coloured view based on a B&W photograph dating from 1947. In life the red hue of the snout was slightly more brown (brick red). Note upturned snout and the yellow mental shield and postocular streak

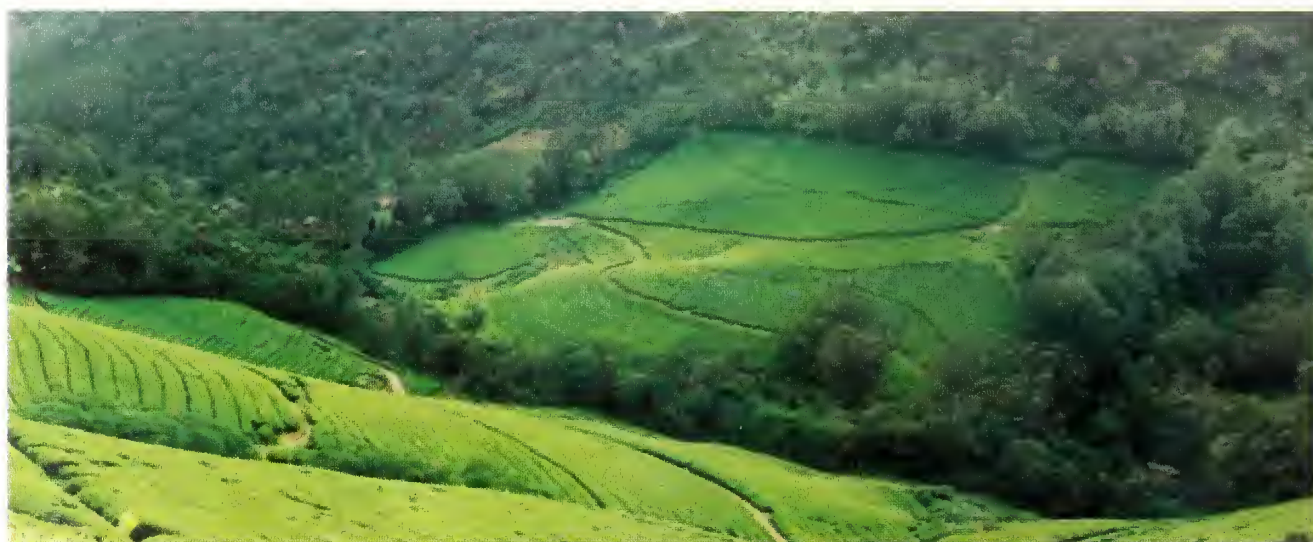


Fig. 3: A composite panorama taken in October 1993 of part of the Manalaar Tea Estate just below the junction of Manalaar and Chinna Manalaar rivers. Downstream of the confluence the stream becomes the Suruli river. Note the jungle corridors left in place. Manalaar is at the extreme right of the panorama; Mt. Pakkadi Mettu, c. 1,898 m, is at the centre of the picture

field data. The spelling of Indian names of localities follows Ravi (2001).

Measurements were measured to the nearest millimetre. Ventral scales were counted according to Dowling (1951). The terminal scute is excluded from the number of subcaudals. The number of dorsal scale rows at mid-body is counted at the level of the ventral plate corresponding to half of the total ventral number. Values for symmetric head characters are given in left /right order. The number of examined specimens appearing under each species details may differ in tables, as specimens in bad condition were not examined in details.

Abbreviations: SVL: Snout-vent length; TaL: Tail length; TaL/TL: ratio tail length/total length; TL: total length.

Scalation characters: ATem: anterior temporals; C-SL3: number of scale(s) between the 3rd supralabial scale and the subocular; CEP: number of cephalic scales on a line between the eyes; DSR: dorsal scale rows; IL: infralabial scales; Lor: loreal scales; MSR: number of dorsal scale rows at midbody; PreOc: preocular scales; PSR: number of dorsal scale rows before vent; SC: subcaudals; SL: supralabials; SL-orb: number of supralabial(s) entering orbit; Tem: temporal scales; VEN: ventral scales.

Museum abbreviations: BMNH: The Natural History Museum, London, UK; BNHS: Bombay Natural History Society, Mumbai, India.

RESULTS

Historical background

The first herpetological paper by Hutton (1949a) was based on collections and observations made in 1946-48. At that time, the senior author of this paper, then aged 18 who was born in Mysore State (now Karnataka state) and had the advantage of being fluent in Tamil and several dialects, had commenced work in the High Wavy Mts. as Assistant Manager with Tea Estates (India) Ltd, a subsidiary company of Brooke Bonds of England, one of the leading Tea producing companies of the time in India.

His work involved surveying and clearing the jungle for planting up a thousand acre Cinchona and Tea estate, leaving the natural vegetation on the river systems untouched and also preserving essential jungle corridors for migrating Elephants and other wildlife. Windbreaks were left intact on the ridges as protection from the South West monsoon winds. This work provided a unique opportunity for collecting specimens of flora and fauna, as upwards of 500 contract workers were employed at any one time. He also assisted the manager and engineers with the survey and construction by some 300 workers of the access ghat road from Chinnamanur, in the Kambam valley, that took two years to build and this

provided even more opportunities for collecting.

As the 'tappal' (Mail) runner complained about the weight of pickled snake specimens, sealed in tins of spirit, that he had to carry for 8 hours to the Kambam Post Office, Angus Hutton ascertained from the BNHS that, provided the head and tail ends were preserved intact, it was quite acceptable to skin out the intermediate section to save weight. It is for this reason that such a large number of specimens are described as skinned!

In August 1948 Hutton went to the UK on four months furlough with more snake and lizard specimens, which were deposited with Dr. Malcolm A. Smith in the collection of the then BMNH, now the Natural History Museum, London, to add to others preserved in spirit, which had been forwarded by the BNHS for identification.

Hutton's 1948 collection also included the second known specimen of the Skink *Dasia subcaerulea* (Boulenger 1891) collected in the High Wavy Mts., 1,798 m above msl, some 16 km from the type locality of this species located near Bodinaikkanur, c. 335 m (Boulenger 1891). This second specimen was described by Smith (1949b).

On returning to India in January 1949 Hutton was transferred to the Anaimalai Hills to the Company's Monica and Injapara tea estates as senior assistant, for 2 years, followed by 6 months relieving on Kadamane tea estate in Mysore and finally appointed manager of Rockwood tea estate in the Nilgiri Wynaad where he remained till July 1952 where he completed his contract.

Each year in India, during his 2 weeks local leave he visited the High Wavy Mts., now known as the Meghamalai Hills, Teni district, Tamil Nadu hoping to obtain more specimens of *T. huttoni*, alas without success, though the patch of Bamboo at the confluence of the Manalaar and Chinna Manalaar rivers where the original capture was made was totally intact as it was in one of the jungle corridors that had been left for migrating elephants.

The author collected a good number of reptile specimens both in the High Wavy Mts. and also in two other ranges of South India, the Nilgiri Wayanad (now the Wayanad district, Kerala) and the Anaimalai Hills (Coimbatore district, also in Tamil Nadu) and took these specimens with him to UK and deposited them in the BMNH, London in July 1952. Specimens were identified by the curator, J.C. Battersby (*in litteris*, dated November 29, 1954). This collection is rich with 6 lizard species, all common species, and 136 snake specimens, of which 129 are still in the collections of the BMNH. Up to now, the contents of this second collection had never been published in detail.

The High Wavy Mts. received little attention prior to the publications of Angus Hutton. Blatter and Hallberg (1917)

reported on a botanical tour, whereas Wroughton (1917) published data on the mammals. These authors put emphasis on the poor knowledge of this hilly range, the top of which was then still covered with dense evergreen forests.

It should be pointed out that, at that time and up to the establishment of Tea estates that first commenced at Cloudlands, just before World War II, to around 1946, the High Wavy Mts. were still a remote area. It took the senior author an 8 hour walk or ride on a horse to reach the estates from the nearby city of Kambam prior to the construction of the vehicular ghat road.

A DESCRIPTION OF THE HIGH WAVY MOUNTAINS

A short description of the High Wavy Mountains was provided by David and Vogel (1998), but it was both incomplete and erroneous: this plateau is definitely no longer the remote, unexplored and uninhabited area described by earlier naturalists who visited this mountain range!

The High Wavy Mountains are now known as the Meghamalai Hills (Fig. 1), from the Tamil words *Megha*, a cloud, and *Malai*, a hill. During A. Hutton's service days, this name only applied to the eastern end where Cloudland Estate was the earliest planted area. The High Wavy Mts. area was always called Patchakumachi, from the Tamil word *Patcha*, green, and *Kumachi*, a jungle, which may be loosely translated as "Green jungle". The name "High Wavy Mountains" was applied by the earlier explorers who just noted the appearance from the then Cumbum (Kambam) valley - that is just how they appear. In those days, the 198 m drop of the Suruli river waterfall was a scenic beauty, though the Hydro Electric Scheme dam above the falls has now cut the flow of water to a small trickle.

This elevated plateau constitutes a spur from the Cardamom Hills oriented southwest-northwest on the southwestern edge of the Varushanad Hills (or Varusanadu Hills). The Varushanad hills extend in a north-east direction; east near Thekkadi from the junction of Cardamom Hills and Pandalam Hills towards the Andipatti Hills just west of Madurai. The Meghamalai Hills constitute the western edge of the Varushanad Hills along the deep Kambam Valley. The city of Kambam (formerly Cumbum; 9° 43' 60" N; 77° 17' 60" E) is about 15 km north-west of the Meghamalai Hills, whereas Gudalur is closer, at about 10 km east of the southern part of the range. The Meghamalai range is located in Teni (or Theni) district of the state of Tamil Nadu, in southern India. The southern tip of this range is located very close to the limit between the limit of the State of Kerala. The south westernmost edge of the Meghamalai Hills borders the Idukki district of Kerala. Lastly, the south-western part of the range

is adjacent to the famous Periyar lake and Tiger Reserve in Kerala.

The Meghamalai Hills are made of steep slopes and precipitous hills, which culminate by a cool and misty plateau approximately only 45 sq. km in area, with undulating hills at an average elevation of about 1,550 m above sea level. The highest point of the range, Brook's Peak, top at 1,965 m above sea level.

According to ancient reports such as Blatter and Hallberg (1917) and Wroughton (1917), the High Wavy Mts. were heavily covered with dense, dark evergreen forests with thick undergrowth. Only a few patches of ground remained bare.

Nowadays, the Meghamalai Hills are subject to much pressure. This plateau has become quite a tourist spot, for some parts open to the public, especially around the Suruli river waterfall. Other parts have been cleared since 1946 and extensive plantations established.

Most of the cultivated area is now covered with Tea estates of which the access is highly restricted. This area has about 12.15 sq. km of the world's finest tea and two ultra modern Tea factories. For example, the locality where specimens of *Tropidolaemus huttoni* were collected is at about one kilometre east of Brook's Peak. This area is now enclosed in the Manalaar Tea estate, which produces one of the most famous Teas in India, a clonal selected high yielding Tea. According to the website www.teabungalows.com (accessed on May 02, 2008), the largest Tea plantation, the Highways Group, is owned by the Woodbriar group. Other plantations nearby include Cardamom, Pepper and Coffee. However, the southernmost part of the Meghamalai Hills, close to the Periyar Reserve, is still covered with dense forests.

Currently, the vegetation ranges from dry scrub forests on the foothills up to about 915 m above msl, then to the plantations cited above on the plateau, which replaced the evergreen forests of the past. Ridges overlooking the valleys are covered with grass whereas the hill-bamboo *Ochlandra travancorica* edges the tracts of evergreen forest. Large patches of evergreen forests are still present only on the higher summits. However, even within the extensive Tea estates, extensive tracts of undisturbed forests and of bamboo have been deliberately left and preserved as windbreaks and to protect the rivers and preserve natural wildlife corridors. These natural corridors allow the annual migration of wild elephants, which are still abundant, across the range (Fig. 3) and are used by monkeys, deers (Sambar) and birds. All natural ridges, as well as watercourses were left.

DESCRIPTION OF THE COLLECTION OF 1952

The senior author took this collection to the BMNH

(London) in 1952, but specimens were entered in collection in 1955.

UROPELTIDAE Müller, 1831

***Melanophidium punctatum* Beddome, 1871**

Material Examined: 3 specimens; BMNH 1955.1.2.93-94 (2 females), "Anamallies", now Anaimalai Hills. BMNH 1955.1.2.95 (female), "High Wavy Mts.", now Meghamalai Hills.

Biology: Collected at 1,066 m above msl in the Meghamalai Hills.

Note: These specimens agree well with the descriptions provided in Smith (1943) and Whitaker and Captain (2004).

Description: BMNH 1955.1.2.93: SVL 457 mm, TaL 23 mm; VEN 177, SC 16; 16-15-13 DSR. Ochre-brown above, with scales edged with brown on their lower part (Table 1).

***Plecturus perroteti* Duméril, Bibron & Duméril, 1854**

Material Examined: 1 specimen; BMNH 1955.1.2.92 (female), "Nilgiri-Wynaad", now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: Collected at 1,066 m above msl.

Note: This specimen agrees well with the descriptions provided in Smith (1943), Rajendran (1985) and Whitaker and Captain (2004).

Description: SVL 217 mm, TaL 8 mm; VEN 168, SC 8; 15-15-15 DSR. Ochre-brown above, with scales edged with brown on their lower part.

***Uropeltis ceylanicus* Cuvier, 1829**

Material Examined: 10 specimens; BMNH 1955.1.2.82-83, BMNH 1955.1.2.90 (3 males), BMNH 1955.1.2.81, BMNH 1955.1.2.84-85, BMNH 1955.1.2.91 (4 females), "Nilgiri-Wynaad", now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.2.86 (1 female), High Wavy Mts. BMNH 1955.1.2.87-88 (2 females), "Anamallies", now Anaimalai Hills.

Biology: Collected at 1,066 m above msl in the Nilgiri Hills, between 914 and 1,066 m in the High Wavy Mts. and between 609 and 1,981 m in the Anaimalai Hills.

Note: These specimens agree well with the descriptions provided by Smith (1943) and Whitaker and Captain (2004).

Main morphological characters are summarized in Table 2. In all specimens, the portion of the rostral visible from above is distinctly shorter than the distance rostral-frontal. The venter is yellow, either only speckled with dark brown (BMNH 1955.1.2.81) or with dark brown spots, or largely barred with black crossbars wider than the yellow areas (BMNH 1955.1.2.82 and BMNH 1955.1.2.86).

We could not find any previous published record of this species from the Nilgiri Hills, either in Smith (1943), in Rajendran (1985) or Murthy (1990).

***Uropeltis maculatus* (Beddome, 1878)**

Material Examined: 1 specimen; BMNH 1955.1.2.73 (female), "Nilgiri-Wynaad", now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: Collected at 1,066 m above msl.

Note: This specimen agrees well with the descriptions provided in Rajendran (1985) and Whitaker and Captain (2004). Main morphological characters are summarized in Table 2. Two large coral spots are present on each side of the tail.

***Uropeltis ocellatus* (Beddome, 1863)**

Material examined: 7 specimens; BMNH 1955.1.2.74, BMNH 1955.1.2.76, BMNH 1955.1.2.78 (3 males), BMNH 1955.1.2.75, BMNH 1955.1.2.77 (2 females), "Nilgiri-Wynaad", now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.2.79 (female), BMNH 1955.1.2.80 (sex unknown; bad condition), "Anamallies", now Anaimalai Hills.

Biology: Specimens from the Nilgiri Hills were collected at 1,066 m above msl. Those from the Anaimalai Hills were obtained between 609 and 1,981 m.

Note: These specimens agree well with the descriptions provided in Rajendran (1985) and Whitaker and Captain (2004). Main morphological characters are summarized in Table 2. Two large coral spots are present on each side of the tail. Specimens from the Nilgiri are brown above, whereas those from the Anaimalai Hills are light greyish-green.

***Uropeltis pulneyensis* (Beddome, 1863)**

Material Examined: 7 specimens; BMNH 1955.1.2.68-69, BMNH 1955.1.2.72 (3 males), BMNH 1955.1.2.70-71

Table 1: Main characters of specimens of *Melanophidium punctatum*

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	DSR
BMNH 1955.1.2.93	F	457	23	0.048	177	16	16-15-13
BMNH 1955.1.2.94	F	-	-	-	176	15	16-15-13
BMNH 1955.1.2.95	F	440	27	0.058	186	14	16-15-13

(2 females), "High Wavy Mts.", now Meghamalai Hills.

Biology: Collected between 914 and 1,066 m above msl.

Note: These specimens agree well with the descriptions provided in Smith (1943), Rajendran (1985), and Whitaker and Captain (2004). Main morphological characters are summarized in Table 2. Two large coral spots are present on each side of the tail.

***Uropeltis rubromaculatus* (Beddome, 1867)**

Material Examined: 1 specimen; BMNH 1955.1.2.89 (1 male), "Nilgiri-Wynaad", now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: Collected around 1,066 m above msl.

Note: This specimen agrees well with the descriptions provided in Smith (1943) and Whitaker and Captain (2004). Main morphological characters are summarized in Table 2. Pattern: above dark brown with each scale tinged with yellow;

six coral red blotches on each side of the anterior part of the body; one elongated, curved, boomerang-like blotch on each side of the tail; venter yellow with scales speckled with brown on their anterior margin.

BOIDAE Gray, 1825

***Eryx johnii* (Russell, 1801)**

Material Examined: 1 specimen; BMNH 1955.1.2.66 (male; SVL 577 mm, TaL 43 mm; skin only), "Anamallies", now Anaimalai Hills.

Biology: Collected between 609 and 1,981 m above msl. Nothing else recorded.

Note: This specimen agrees well with the descriptions provided in Smith (1943).

***Gongylophis conicus* (Schneider, 1801)**

Material Examined: 1 specimen; BMNH 1955.1.2.67 (female; SVL 604 mm, TaL 38 mm; skin only), "Nilgiri-

Table 2: Main morphological characters of examined specimens of the genus *Uropeltis* Cuvier, 1829

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	MSR	PSR
<i>Uropeltis ceylanicus</i>								
BMNH 1955.1.2.82	M	224	16	0.067	121	10	17	17
BMNH 1955.1.2.83	M	206	14	0.064	131	10	17	17
BMNH 1955.1.2.84	M	180	11	0.058	133	8	17	17
BMNH 1955.1.2.90	M	245	16	0.062	134	10	17	17
BMNH 1955.1.2.81	F	288	16	0.053	127	9	17	17
BMNH 1955.1.2.85	F	238	12	0.048	129	8	17	17
BMNH 1955.1.2.86	F	188	9	0.046	132	8	17	17
BMNH 1955.1.2.87	F	229	14	0.058	122	9	17	17
BMNH 1955.1.2.88	F	254	9	0.034	124	8	17	17
BMNH 1955.1.2.91	F	262	12	0.044	134	8	17	17
<i>Uropeltis maculatus</i>								
BMNH 1955.1.2.73	F	282	8	0.028	159	6	17	17
<i>Uropeltis ocellatus</i>								
BMNH 1955.1.2.74	M	231	11	0.045	207	9	17	17
BMNH 1955.1.2.76	M	222	8	0.035	207	10	17	17
BMNH 1955.1.2.78	M	151	5	0.032	212	8	17	17
BMNH 1955.1.2.73	F	282	8	0.028	209	6	17	17
BMNH 1955.1.2.75	F	281	9	0.031	206	8	17	17
BMNH 1955.1.2.77	F	224	6	0.026	210	6	17	17
<i>Uropeltis pulneyensis</i>								
BMNH 1955.1.2.68	M	204	10.5	0.049	173	11	17	17
BMNH 1955.1.2.69	M	188	10	0.051	173	12	17	17
BMNH 1955.1.2.72	M	199	10.5	0.050	176	12	17	17
BMNH 1955.1.2.70	F	258	8	0.030	180	7	17	17
BMNH 1955.1.2.71	F	227	8	0.034	179	7	17	17
<i>Uropeltis rubromaculatus</i>								
BMNH 1955.1.2.89	F	279	17	0.057	128	9	17	17

Wynaad”, now Wayanad District, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: Collected at 1,066 m above msl. Nothing else recorded.

Note: This specimen agrees well with the descriptions provided in Smith (1943).

COLUBRIDAE Oppel, 1811

***Ahaetulla dispar* (Günther, 1864)**

Material Examined: 8 specimens; BMNH 1955.1.3.50 (female; Table 3), BMNH 1955.1.3.51-52 (2 males), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.3.53-55 (3 males), BMNH 1955.1.3.56-57 (2 females), “Anamallies”, now Anaimalai Hills.

Biology: Collected at 914-1,066 m above msl in the Nilgiri Hills, and between 609 and 1,981 m in the Anaimalai Hills.

Note: These specimens agree well with the description provided in Smith (1943) and Whitaker and Captain (2004).

***Ahaetulla nasuta* (Lacepède, 1789)**

Material Examined: 2 specimens; BMNH 1955.1.3.58 (male; SVL 650, TaL 398 mm), Mysore. BMNH 1955.1.3.59 (female; SVL 682 mm, TaL 368 mm), Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: Collected at 1,066 m in both localities.

Note: These specimens agree well with the description provided in Smith (1943) and Whitaker and Captain (2004).

***Boiga ceylonensis* (Günther, 1858)**

Material Examined: 8 specimens; BMNH 1955.1.3.42 (female; see Table 4), BMNH 1.3.43-45 (3 males), “High Wavy Mts.”, now Meghamalai Hills. BMNH 1955.1.3.46, BMNH 1955.1.3.49 (2 females), BMNH 1955.1.3.47-48

(2 skins), “Anamallies”, now Anaimalai Hills.

Biology: Collected at 914-1,066 m above msl in the Meghamalai Hills and between 609 and 1,981 m in the Anaimalai Hills.

Note: These specimens agree well with the description provided in Smith (1943) and Whitaker and Captain (2004). Main characters are summarized in Table 4.

***Coelognathus helena monticollaris* (Schulz, 1992)**

Material Examined: 7 specimens; BMNH 1955.1.3.25 (male; SVL 540 mm, TaL 147 mm), “Anamallies”, now Anaimalai Hills. BMNH 1955.1.3.26-27 (2 females; SVL 511 & 257 mm, TaL 104 & 66 mm), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.3.28 (male; SVL 770 mm, TaL 228 mm; skin only), BMNH 1955.1.3.29 (female; SVL 1,188 mm, TaL 226 mm; skin only), Mysore. BMNH 1955.1.3.30-31 (2 males; SVL 376 & 256 mm, TaL 89 mm & tail broken), “High Wavy Mts.”, now Meghamalai Hills.

Biology: Collected at 1,066 m in the Nilgiri Mts., between 609 and 1,981 m in the Anaimalai Hills and at 914-1,066 m in the Meghamalai Hills.

Note: This species was previously placed in the genus *Elaphe*. It was transferred to the genus *Coelognathus* Fitzinger, 1843 by Helfenberger (2001) and Utiger *et al.* (2002).

These specimens agree well with the description provided in Schulz (1996). All have 25 dorsal scale rows at mid-body. Crossbars with the typical white ocelli are present only on the anterior half of the body on a rather dark background. These specimens are typical of *Coelognathus helena monticollaris* (Schulz, 1992), endemic to the Western Ghats, whereas the nominate subspecies *Coelognathus helena helena* (Daudin, 1803) inhabits other parts of India and Sri Lanka.

***Dendrelaphis pictus* (Gmelin, 1789)**

Material Examined: 2 specimens; BMNH 1955.1.3.32-33 (2 females; SVL 642 & 368 mm, TaL 425 & 246 mm),

Table 3: Main morphological characters of examined specimens of *Ahaetulla dispar*

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	MSR	PSR	SL	PreOc	Tem
BMNH 1955.1.3.51	M	520	249	0.324	157	110	15	13	8 / 8	2 / 2	2+2 / 2+2
BMNH 1955.1.3.52	M	269	-	-	151	-	15	13	8 / 8	2 / 2	2+2 / 2+2
BMNH 1955.1.3.53	M	468	248	0.346	149	115	15	13	8 / 8	2 / 2	2+2 / 2+2
BMNH 1955.1.3.54	M	430	216	0.334	148	109	15	13	8 / 8	1 / 1	2+2 / 2+2
BMNH 1955.1.3.55	M	431	227	0.345	153	116	15	13	8 / 8	0 / 0	2+2 / 2+2
BMNH 1955.1.2.50	F	540	242	0.309	146	98	15	13	8 / 8	2 / 2	2+2 / 2+2
BMNH 1955.1.2.56	F	415	165	0.284	146	99	15	13	8 / 8	2 / 2	2+2 / 2+2
BMNH 1955.1.3.57	F	307	131	0.299	145	86	15	13	8 / 8	2 / 1	2+2 / 2+2

“Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: Collected at 1,066 m above msl.

Note: These specimens agree well with the description provided in Smith (1943) and Van Rooijen and Vogel (2008). They are dark coloured and rather uniform in pattern at the exception of the dark postocular stripes.

***Lycodon aulicus* (Linnaeus, 1758)**

Material Examined: 2 specimens; BMNH 1955.1.3.11 (female; SVL 238 mm, TaL 42 mm), Mysore. BMNH 1955.1.3.12 (male; skin only), “Anamallies”, now Anaimalai Hills.

Biology: Collected at 1,066 m above msl. Nothing else was recorded.

Note: These specimens agree well with the description provided in Smith (1943). Both have 17 MSR and the typical dorsal pattern.

***Lycodon travancoricus* (Beddome, 1870)**

Material Examined: 8 specimens; BMNH 1955.1.3.13-14 (2 females; SVL 342 & 486 mm, TaL 83 & 108 mm), BMNH 1955.1.3.15 (juvenile; SVL 151, TaL 38 mm), “Anamallies”, now Anaimalai Hills. BMNH 1955.1.3.16 (male; SVL 405 mm, TaL 101 mm), BMNH 1955.1.3.17 (female; body partly cut), “Nilgiri - Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.3.18 (female; SVL 255, TaL 66 mm), BMNH 1955.1.3.19 (male; SVL 142 mm, TaL 36 mm), BMNH 1955.1.3.20 (unsexed juvenile), “High Wavy Mts.”, now Meghamalai Hills. Another specimen, BMNH 1955.1.3.21, was exchanged in 1955 and is no longer present in the BMNH’s collections.

Biology: All specimens were collected between 914 and 1,066 m.

Note: This specimen agrees well with the descriptions provided in Smith (1943) and Whitaker and Captain (2004).

They do not belong to *Lycodon flavicollis* Mukherjee and Bhupathy (2007) as defined by these latter authors.

***Oligodon taeniolatus* (Jerdon, 1853)**

Material Examined: 1 specimen; Unnumbered specimen (female; desiccated and damaged; Table 3), no locality.

Biology: No data.

Note: These specimens agree well with the Form IV of Smith (1943).

***Oligodon travancoricus* Beddome, 1877**

Material Examined: 6 specimens; BMNH 1955.1.3.35 (male; Table 3), BMNH 1955.1.3.36-39 (4 females), BMNH 1955.1.3.41 (sex only, head and neck only), “High Wavy Mts.”, now Meghamalai Hills. Another specimen, BMNH 1955.1.3.40, was exchanged in 1955, and is no longer present in the BMNH’s collections.

Biology: Collected between 914 and 1,828 m.

Note: These specimens agree well with the description provided in Smith (1943). Their main characters are summarized in Table 5.

***Oligodon venustus* (Jerdon, 1853)**

Material Examined: 1 specimen; BMNH 1955.1.3.34 (male; Table 5; badly damaged), “Anamallies”, now Anaimalai Hills.

Biology: Collected between 609 and 1,981 m above msl.

Note: Main characters are summarised in Table 5. This identification is only tentative as, if specimen agree well in scalation and pattern with the description provided in Smith (1943), it has only 15 MSR due to a reduction at the levels of VEN 66 & 67 at right and left respectively. Its pattern is made of dark purple dorsal blotches and a venter chequered with white and black.

We could not find any previous published record of this species from the Anaimalai Hills, either in Smith (1943) or Murthy (1990).

Table 4: Main morphological characters of examined specimens of *Boiga ceylonensis*

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	MSR	PSR	ATem
BMNH 1955.1.3.43	M	809	236	0.226	223	118	21	17	3 / 3
BMNH 1955.1.3.44	M	828	248	0.230	218	122	21	17	3 / 3
BMNH 1955.1.3.45	M	751	218	0.225	233	119	21	17	3 / 3
BMNH 1955.1.3.47	F	806	233	0.224	244	104	21	17	3 / 3
BMNH 1955.1.3.48	F	796	236	0.229	242	106	21	17	3 / 3
BMNH 1955.1.3.42	F	598	158	0.209	215	76	19	17	3 / 3
BMNH 1955.1.3.46	F	502	133	0.209	232	102	21	17	3 / 3
BMNH 1955.1.3.49	F	812	-	-	241	-	21	17	3 / 3



Fig. 4: The senior author in December 1946 with the skins of two very large specimens of *Naja naja*

***Ptyas mucosa* (Linnaeus, 1758)**

Material Examined: 4 specimens; BMNH 1955.1.3.22 (female; SVL 365 mm, TaL 126 mm), BMNH 1955.1.3.23 (male; SVL 330 mm, TaL 129 mm), “Anamallies”, now Anaimalai Hills. BMNH 1955.1.3.24 (male; SVL 325 mm, TaL 131 mm), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka

and Tamil Nadu. Unnumbered specimen (female; SVL 360 mm, TaL 138 mm), no locality.

Biology: Collected at 1,066 m above msl in the Nilgiri Mts., between 609 and 1,981 m in the Anaimalai Hills.

Note: These specimens agree well with the description provided in Smith (1943).

NATRICIDAE Bonaparte, 18401

***Amphiesma beddomei* (Günther, 1864)**

Material Examined: 11 specimens; BMNH 1955.1.2.96-97 (2 females), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.2.98-99 (2 males), Mysore. BMNH 1955.1.3.1 (male), BMNH 1955.1.3.2 (female), “High Wavy Mts.”, now Meghamalai Hills. BMNH 1955.1.3.3-4 (3 males), BMNH 1955.1.3.5-6 (2 females), “Anamallies”, now Anaimalai Hills. Another specimen, BMNH 1955.1.3.7, was exchanged in 1955 and is no longer present in the BMNH’s collections. Unnumbered specimen (female; SVL 412 mm, TaL > 128 mm, part of tail missing), no locality.

Biology: All specimens were collected between 609 and 1,981 m. The unnumbered specimen contains a toad in its stomach.

Note: This specimen agrees well with the descriptions provided in Smith (1943) and Whitaker and Captain (2004). Main morphological characters are summarised in Table 6. Other characters include: divided nasals; dorsal scales keeled above. Body more or less distinctly patterned, with all intermediates; a white postocular streak, edged with black above in all specimens.

***Amphiesma stolatum* (Linnaeus, 1758)**

Material Examined: 1 specimen; Unnumbered specimen (female; SVL 390 mm, TaL 119 mm), no locality.

Table 5: Main morphological characters of examined specimens of *Oligodon* Boie, 1827

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	DSR	Anal	SL	Lor
<i>Oligodon taeniolatus</i>										
BMNH unnumbered	F	283	49	0.148	-	-	15-15-15	2	7/7	1/1
<i>Oligodon travancoricus</i>										
BMNH 1955.1.3.35	M	330	62	0.158	141	34	17-17-15	2	7/7	0/0
BMNH 1955.1.3.36	F	332	52	0.135	152	31	17-17-15	2	7/7	0/0
BMNH 1955.1.3.37	F	292	41	0.141	158	29	17-17-15	2	7/7	0/0
BMNH 1955.1.2.39	F	128	21	0.141	159	30	17-17-15	2	7/7	0/0
<i>Oligodon venustus</i>										
BMNH 1955.1.3.34	M	295	55	0.157	141	32	17-15-15	- 2	7/7	1/1

Biology: No data.

Note: This specimen is typical of the species.

***Macropisthodon plumbicolor* (Cantor, 1839)**

Material Examined: 2 specimens; BMNH 1955.1.3.8-9 (2 females; skins only), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: Collected at 1,066 m above msl. Nothing else recorded.

Note: Only the skins of these specimens were preserved. They agree well with the description provided in Smith (1943).

XENODERMATIDAE Gray, 1849

***Xylophis perroteti* Reinhardt, 1836**

Material Examined: 1 specimen; BMNH 1955.1.3.10 (male; skull removed), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: This specimen was collected at 1,066 m.

Note: This specimen agrees well with the description provided in Smith (1943).

ELAPIDAE Boie, 1827

***Bungarus caeruleus* Schneider, 1801**

Material Examined: 2 specimens; BMNH 1955.1.3.61-62 (2 males; SVL 762 and 880 mm, TaL > 95 and 120 mm), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu.

Biology: These specimens were collected at 1,066 m.

Note: Both specimens agree well with the description provided in Smith (1943).

***Calliophis nigrescens* (Günther, 1862)**

Material Examined: 6 specimens; BMNH 1955.1.3.63-65 (3 females; SVL 405, 235 and 162 mm, TaL 45, 23 and 18 mm), “Nilgiri-Wynaad”, now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.3.66-68 (3 males; SVL 412, 360 and 460 mm, TaL 51, 42 and 49 mm), “Anamallies”, now Anaimalai Hills.

Biology: Collected at 1,066 m above msl. Specimen BMNH 1955.1.3.68 contains an adult *Limnonectes limnocharis* (Gravenhorst, 1829) in its stomach.

Note: The generic position follows Slovinski *et al.* (2001). All specimens agree well with the description provided in Smith (1943). Specimens BMNH 1955.1.3.63, BMNH 1955.1.3.64, BMNH 1955.1.3.66, and BMNH 1955.1.3.67 belong to the Form 1 of Smith (1943), whereas others belong to Form 2.

***Naja naja* (Linnaeus, 1758)**

Material Examined: (Fig. 4): 2 specimens; Two skins of the 1946' collection, High Wavy Ghat Road, “High Wavy Mts.”, now Meghamalai Hills.

Biology: These specimens were not previously discussed. Both skins are conserved in the private collection of the senior author. However, they are worth being mentioned here due to their size. One specimen was 179 cm long, the other one 229 cm long.

***Ophiophagus hannah* (Cantor, 1836)**

While no specimens were examined, this species was encountered a few times in the High Wavy Mts. during the construction of the Ghat Road in the lower altitude section between Chinnamanur and the Varushanad Valley.

The senior author came across the species in all the Tea plantation areas where he worked but never collected a specimen of such a well known and dangerous snake, which usually preferred to get out of the way.

Table 6: Main morphological characters of specimens of *Amphiesma beddomei*

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	MSR	PSR	SL	SL-orb	Tem
BMNH 1955.1.2.98	M	380	-	-	143	-	19	17	8/8	4-5/4-5	1+1/1+1
BMNH 1955.1.2.99	M	370	134	0.266	139	69	19	17	9/9	4-6/4-6	1+2/1+2
BMNH 1955.1.3.1	M	420	148	0.261	140	68	19	17	8/8	3-5/3-5	1+2/1+2
BMNH 1955.1.3.3	M	402	129	0.243	145	61	19	17	8/8	3-5/3-5	1+2/1+2
BMNH 1955.1.3.4	M	413	140	0.253	146	62	19	17	8/9	3-5/4-6	1+2/1+2
BMNH 1955.1.2.96	F	321	102	0.241	146	66	19	17	9/9	4-6/4-6	1+2/1+2
BMNH 1955.1.2.97	F	336	106	0.240	144	62	19	17	8/8	3-5/3-5	1+1/1+1
BMNH 1955.1.3.2	F	382	-	-	142	-	19	17	8/8	3-5/3-5	1+1/1+2
BMNH 1955.1.3.5	F	290	102	0.260	144	67	19	17	8/8	3-5/3-5	1+2/1+2
BMNH 1955.1.3.6	F	251	85	0.253	140	65	19	17	8/8	3-5/3-5	1+2/1+2

It is worth recording that in 1921 Angus Hutton's father accidentally caught a King Cobra alive that was lying on the overhead shade in a Tea nursery, mistaking it for a common Rat Snake that he had planned to put in the Rice Store! He was lucky to get out of the situation alive, after the labourers had all fled, thanks to help by the foreman with a large stone. The senior author still has the skin in his personal collection. It is 325 cm long.

VIPERIDAE Opper, 1811

Trimeresurus (Peltopelor) macrolepis (Beddome, 1862)

Material Examined: 14 specimens; BMNH 1955.1.3.82, Unnumbered specimen 1 (2 males; Table 7; skin), BMNH 1955.1.3.83-85, Unnumbered specimens 2-3 (5 females), "Anamallies", now Anaimalai Hills. BMNH 1955.1.3.86, BMNH 1955.1.3.88-90 (4 females; see Table 7), BMNH 1955.1.3.87 (male), BMNH 1955.1.3.91-92 (2 unsexed, juvenile specimens; damaged, scales not counted), "South India", no precise locality. Three other specimens, BMNH 1955.1.3.93-95, were exchanged in 1955 and are no longer present in the BMNH's collections.

Biology: Specimens of Anaimalai Hills were collected between 609 and 1,981 m above msl. Specimen BMNH 1955.1.3.88 contains a rodent in its stomach.

Note: This species was referred to the genus *Peltopelor* Günther, 1864 by Malhotra and Thorpe (2004). For reasons explained elsewhere (David *et al.* 2009), we regard the genera recognized by these authors as subgenera of the genus *Trimeresurus* Lacepède, 1804.

Trimeresurus (Trimeresurus) malabaricus (Jerdon, 1854)

Material Examined: 12 specimens; BMNH 1955.1.3.69 (male), BMNH 1955.1.3.70-71 (2 females; Table 7; specimen BMNH 1955.1.3.71 as a skin only), "Nilgiri-Wynaad", now Wayanad district, Kerala, at the border between the states of Kerala, Karnataka and Tamil Nadu. BMNH 1955.1.3.72-73, BMNH 1955.1.3.75 (3 females; skins only), BMNH 1955.1.3.74 (male; skin only), "Anamallies", now Anaimalai Hills. BMNH 1955.1.3.76, BMNH 1955.1.3.80 (2 males; skins only), BMNH 1955.13.77-79 (3 females; skins only), Mysore. Another specimen, BMNH 1955.1.3.81, was exchanged in 1955 and is no longer present in the BMNH's collections.

Table 7: Main morphological characters of specimens of *Trimeresurus* Lacepède, 1804

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	DSR	CEP	SL	C-SL3
<i>Trimeresurus macrolepis</i>										
BMNH 1955.1.2.82	M	479	109	0.185	139	51	17-13-9	1	8 / 8	0 / 0
BMNH 1955.1.2.87	M	482	139	0.224	133	56	16-13-10	1	8 / 8	0 / 0
BMNH 1955.1.3.89	M	480	120	0.200	136	50	16-13-11	2	7 / 7	0 / 0
BMNH Specimen 1	M	422	104	0.198	136	52	16-13-10	3	8 / 8	0 / 0
BMNH 1955.1.3.83	F	472	92	0.163	143	48	16-13-10	1	8 / 7	0 / 0
BMNH 1955.1.3.84	F	467	95	0.169	143	50	16-15-11	1	8 / 8	0 / 0
BMNH 1955.1.2.85	F	572	116	0.169	140	47	17-14-11	3	8 / 8	0 / 0
BMNH 1955.1.2.86	F	690	141	0.170	138	48	19-13-11	1	8 / 8	0 / 0
BMNH 1955.1.3.88	F	381	73	0.161	140	50	15-13-9	3	7 / 8	0 / 0
BMNH 1955.1.3.90	F	409	88	0.177	138	47	14-13-10	3	8 / 8	0 / 0
BMNH Specimen 2	F	428	-	-	141	49	16-13-11	3	8 / 8	0 / 0
BMNH Specimen 3	F	395	88	0.182	147	46	16-13-11	3	8 / 8	0 / 0
<i>Trimeresurus malabaricus</i>										
BMNH 1955.1.3.69	M	316	62	0.164	151	58	21-21-15	9	9 / 9	1 / 1
BMNH 1955.1.3.74	M	489	103	0.174	146	58	21-21-15	7	8 / 9	1 / 1
BMNH 1955.1.3.76	M	-	-	-	143	57	21-21-15	9	9 / 9	1 / 1
BMNH 1955.1.3.80	M	208	42	0.168	145	54	21-21-15	10	11 / 10	2 / 2
BMNH 1955.1.3.70	F	204	36	0.150	147	51	23-21-15	10	10 / 10	1 / 1
BMNH 1955.1.3.71	F	408	71	0.148	144	52	21-21-15	11	9 / 10	1 / 1
BMNH 1955.1.3.72	F	662	-	-	148	-	25-21-15	8	10 / 10	1 / 1
BMNH 1955.1.3.73	F	621	107	0.147	149	49	25-21-15	8	9 / 9	1 / 1
BMNH 1955.1.3.75	F	323	48	0.129	149	49	21-21-15	8	10 / 9	1 / 1
BMNH 1955.1.3.77	F	377	54	0.125	150	45	25-21-15	9	11 / 11	1 / 2
BMNH 1955.1.3.78	F	364	52	0.125	150	47	25-21-15	10	9 / 11	2 / 2
BMNH 1955.1.3.79	F	391	57	0.127	146	45	23-21-15	9	9 / 10	1 / 1

Biology: Specimens from Nilgiri Hills and Mysore were collected at 1,066 m above msl, those of the Anaimalai Hills between 609 and 1,981 m.

Note: These specimens agree well with the description provided in Smith (1943).

DISCUSSION

The examination of this new collection allows us to extend the composition of the snake fauna of the "High Wavy Mts." or Meghamalai Hills. We also take this opportunity to present unpublished data on specimens of *Tropidolaemus huttoni*.

A list of snake species of the Meghamalai Hills

On the basis of Hutton (1949a) and of the present collection, we establish a preliminary list of snake species recorded from this area as defined above in the Introduction. A total of 39 species is listed.

We have not recorded in detail morphological characters of the collection of 1946-48, but the determination of the included species were checked. Morphological ecological data of specimens of the 1946-48' collection were given by Hutton (1949a).

Uropeltidae Müller, 1831

- Melanophidium punctatum* Beddome, 1871
- Plecturus perroteti* Duméril, Bibron & Duméril, 1854
- Rhinophis saugineus* Beddome, 1863
- Rhinophis travancoricus* Boulenger, 1892
- Uropeltis arcticeps* (Günther, 1875)
- Uropeltis ceylanicus* Cuvier, 1829
- Uropeltis ellioti* (Gray, 1858)
- Uropeltis pulneyensis* (Beddome, 1863)
- Uropeltis rubromaculatus* (Beddome, 1867)
- Uropeltis woodmasoni* (Theobald, 1876)

Pythonidae Fitzinger, 1826

- Python molurus molurus* (Linnaeus, 1758)

Colubridae Opperl, 1811

- Ahaetulla dispar* (Günther, 1864)
- Ahaetulla perroteti* (Duméril, Bibron & Duméril, 1854)
- Ahaetulla pulverulenta* (Duméril, Bibron & Duméril, 1854)
- Argyrogena fasciolata* (Shaw, 1802)
- Boiga ceylouensis* (Günther, 1858)
- Coelognathus helena* (Daudin, 1803)
- Dryocalamus nympa* (Daudin, 1803)
- Lycodon striatus* (Shaw, 1802)

- Lycodon travancoricus* (Beddome, 1870)
- Oligodon brevicauda* Günther, 1862
- Oligodon taeniolatus* (Jerdon, 1853)
- Oligodon travancoricus* Beddome, 1877
- Oligodon venustus* (Jerdon, 1853)
- Ptyas mucosa* (Linnaeus, 1758)

Natricidae Bonaparte, 1840

- Amphiesma beddomei* (Günther, 1864)
- Amphiesma stolatum* (Linnaeus, 1758)
- Atretium schistosum* (Daudin, 1803)
- Macropisthodon plumbicolor* (Cantor, 1839)
- Xenochrophis piscator* (Schneider, 1799)

Elapidae Boie, 1827

- Calliophis nigresceus* (Günther, 1862)
- Naja naja* (Linnaeus, 1758)
- Ophiophagus haunah* (Cantor, 1836)

Viperidae Opperl, 1811

- Viperinae Opperl, 1811
- Daboia russelii* (Shaw & Nodder, 1797)
- Crotalinae Opperl, 1811
- Trimeresurus (Trimeresurus) granineus* (Shaw, 1802)
- Trimeresurus (Peltopeltor) macrolepis* (Beddome, 1862)
- Trimeresurus (Trimeresurus) malabaricus* (Jerdon, 1754)
- Tropidolaemus huttoni* (Smith, 1949)

An updated account on *Tropidolaemus huttoni* (Smith, 1949)

David and Vogel (1998) expanded the description of *Trimeresurus huttoni* Smith, 1949 and referred this species to the genus *Tropidolaemus* Wagler, 1830. However, the description provided in this paper was rather incomplete. The paratype of *Trimeresurus huttoni* Smith, 1949, BNHS 2658, has been traced and examined. It had been deposited in 1962 in the collection of the then Prince of Wales Museum, Bombay now CSMVS, Mumbai and (presumably) later transferred to the Bombay Natural History Society. The senior author could also provide a description of the pattern of these specimens recorded while they were alive. The most important new character is the bright brick red colour of the snout (Fig. 2), a feature unknown in other species of the genus *Tropidolaemus* as defined in Vogel *et al.* (2007). Precise biological data of these specimens, which remain the sole known specimens, are also made available below.

Morphology

On the basis of this new information, we expand the description of *Tropidolaemus huttoni* as follows:

Material: BMNH 1948.1.8.75 (male; holotype) and BNHS 2658 (female; paratype), both from "The High Wavy Mountains, Madura district, South India; altitude 1,854 m", a locality here précised as: a patch of bamboo at the confluence of the Manalaar and Chinna Manalaar rivers, Manalaar Tea Estate, about 1 airline kilometre full east of Brooks Peak, very close to the border with Kerala, Meghamalai Hills, Teni district, Tamil Nadu. Collected by Angus Hutton on November 09, 1947.

Main morphological characters are summarized in Table 8. Other characters are:

Body: Both juvenile snakes; body moderately stout. Head short and wide at its base, about 1.6 times longer than wide, triangular, clearly distinct from neck, thick, flattened in front of the eye and depressed on the middle of the snout; very sharp jaw angle posteriorly; snout short, flattened, about 2x as long as the diameter of the eye, slightly protracted with its tip slightly raised, rounded and narrow when seen from above, angulous and prominent when seen from the side, with a sharp *canthus rostralis*; eye large (juvenile), diameter similar to the distance between its inferior margin and upper lip edge; tapering tail, cylindrical, long and prehensile. Dorsal scales rhombohedral, all smooth at mid-body, some feebly keeled on the posterior part of body.

Head: Rostral as high as wide, triangular, barely visible from above; nasal triangular, undivided, with nostril in its middle; no nasal pore visible; 1 pair of enlarged, narrow internasals, about twice longer but barely wider than adjacent scales on upper snout surface, separated from one another by 1 or 2 small scales that are about half as wide as the internasals. 4 canthal scales bordering the *canthus rostralis* between the internasal and the corresponding supraocular, slightly enlarged compared with adjacent snout scales; 1 small triangular loreal; 2 upper preoculars above the loreal pit, the lower one bordering the upper margin of the loreal pit, the upper one visible from above, both elongated and in contact with the loreal; the lower preocular that borders the lower margin of the loreal pit is divided into two small scales; 2 postoculars on both sides of both specimens; 1 supraocular, entire, long and narrow, barely larger than the adjacent upper head scales and 0.8-0.9 time as large as internasals, largely indented on its inner margin; upper snout and cephalic scales relatively large, irregular and unequal, barely imbricate, flat, distinctly keeled both on the snout, and on the middle and posterior part of the

head, strongly keeled and imbricate on posterior part of head; 9 cephalic scales on a line between the supraoculars; temporals on three rows, the lower ones enlarged, as large as the supralabials, all strongly keeled; 1 thin, elongated, crescent-like subocular; 9 supralabials on each side in both specimens, third largest; 1st supralabial completely separated from the nasal; 2nd not bordering the anterior margin of the loreal pit and topped by a prefoveal, namely the scale above the supralabial bordering the pit that borders the whole of the anterior margin of the loreal pit, 1 or 2 minute scales on each side between the nasal and the 2nd supralabial; 3rd supralabial large, rather low and elongated, about 2.3 times as long as high, separated both from the posterior lower preocular scale and from the subocular by one small scale; 4th supralabial nearly as high as long than the third one, separated from the subocular by 1 small scale; 5th and other posterior supralabials much smaller than preceding ones, not larger than lower temporals, but smooth; 5th supralabial separated from the subocular by two scale rows and in contact with the first and second lower temporals; 10 pairs of infralabials in both specimens, those of the first pair in contact with each other and obtusely but distinctly keeled, infralabials of the first, second and third pairs in contact with the chin shield; one pair of elongated, keeled chin shields; 6 or 7 rows of gular scales, distinctly keeled.

Pattern in preservative (holotype only, as the paratype is desiccated and turned brown): Dorsal and upper tail surfaces dull green, slightly paler on the body sides, with on each side a series of small, vertically elongated white spots located on the 2nd and 3rd scale rows from the vertebral row, separated each other by about 3-5 scales; no ventrolateral stripes; end of tail dull reddish on a length equivalent to the 25 posterior subcaudal scales. Venter pale green.

Head dull green above and on its sides; a white temporal streak running on the 3rd and 4th rows of temporals from eye to the neck, edged below with a dull, rather indistinct red streak; another white streak extending on the upper preocular and loreal forward the eye, not reaching the nasal; this forward white streak is bordered below with a reddish-brown, indistinct streak that makes the snout tip rather red.

Pattern in life: Body grass green, with on each side a series of small, vertically elongated white spots; interstitial skin yellow. Tail green, with the last inch bright red. Venter

Table 8: Main characters of known specimens of *Tropidolaemus huttoni* (Smith, 1949)

Number	Sex	SVL	TaL	TaL/TL	VEN	SC	DSR	CEP	InS	SL	C-SL3	C-SL4
BMNH 1948.1.8.75	M	98	38	0.279	146	52	25-23-19	9	1	9/9	1/1	1/1
BNHS 1955.1.2.87	F	184	35	0.160	140	48	23-21-17	9	2	9/9	1/1	2/2

light green with white flecks and yellow tinge on their outer margins.

Head green as the body, with a pale yellow temporal streak edged below with a touch of red, brighter in front of the eye than backwards; snout distinctly brick red on its sides and above. Below, lower labials, chin and throat pale green, with the mental scale golden yellow.

The pattern of the head in life is depicted in Fig. 2. This illustration was reconstructed from a black & white picture colourized by the senior author from his own notes.

Biology

Both snakes were caught during day time through a clump of *Ochlandra travancorica*, a local bamboo named *Eeta* in Tamil on the side of an elephant track. The *Shikari* assistant of the senior author, a jungle expert, had never seen such a snake previously. The red, upturned snout and the red wiggling tail distinguished immediately these two snakes from the hundreds of babies of *T. malabaricus*, *T. gramineus* and *T. macrolepis* seen by the senior author. These three latter species are still common in the Tea and Coffee plantations, where they adapted to the leaf litter at the base of the bushes.

When the Tea estate was being surveyed and planned it was decided to leave intact corridors of forests in which elephants could move from the Meghamalai Hills to Periyar lake. These tracts of dense jungle were still extant in 1993. However, this species has never been seen again.

Visits to the area made by the first author between 1949 and 1993

In addition to visits made in 1949, 1950, 1951 and 1952, Angus Hutton revisited the High Wavy Mts. in 1972 when on holiday with his wife and again in 1986 during the course of a UN/FAO Consultancy, and most recently in 1993. On each and every occasion he searched a wide area surrounding the, still standing, Bamboo clump where the initial capture was made in 1946. He also thoroughly questioned the plantation labourers (many of whom remembered him), and showed them pictures and offered a reward and also made arrangements with the management should a specimen turn up. However, though one labourer claimed to have killed a similarly coloured pitviper in the nearby Tea some years before, nothing has eventuated. Sadly, several collecting trips made by Rom Whitaker to the precise area by Hutton indicated have also proved fruitless.

Comparison with *Tropidolaemus wagleri* (Boie, 1827)

A comparison between *Trimeresurus huttoni* and *Tropidolaemus wagleri* was provided in David and Vogel (1998). These species sharing important characters, such as

(1) absence of a nasal pore, (2) second supralabial not bordering the loreal pit, (3) strongly keeled upper snout and cephalic scales, (4) strongly keeled gular scales, (5) strongly keeled temporal scales, (6) white or red and white dorsal spots, and (7) bicour pre- and postocular streaks. On this basis, *Trimeresurus huttoni* was referred to the genus *Tropidolaemus*.

Vogel *et al.* (2007) provided an extensive discussion on variation of *Tropidolaemus wagleri* based on more specimens than those available to David and Vogel (1998). On this basis, *T. wagleri* and *T. huttoni* differ by (1) an upturned snout in *T. huttoni*, (2) a longer tail in males of similar size (150-250 mm), with a ratio TaL/TL of 0.279 for the male of *T. huttoni* vs. 0.179-0.196 in 5 juvenile males of *T. wagleri*, (3) a shorter tail in female of *T. huttoni*, with a ratio of 0.160 vs. 0.176-0.178 in 2 juvenile females of *T. wagleri*, (4) internasals separated in *T. huttoni*, always in contact in *T. wagleri*, (5) a deep red snout in *T. huttoni*, whereas the red hue is present only on the lower edge of the preocular streak in *T. wagleri*, and (6) a mental scale bright golden yellow in *T. huttoni*, whereas it is pale green in *T. wagleri*. As pointed out in David and Vogel (1998), main scalation characters of these two species are identical.

The differences between *Tropidolaemus huttoni* and *Tropidolaemus subannulatus* (Gray, 1842), as defined in Vogel *et al.* (2007), are similar in points (1), (2), with a ratio TaL/TL in males *T. subannulatus* of 0.157-0.173, (5) and (6) Internasals are separated by 1-2 scales in both species.

According to these data, there is no doubt about both the generic belonging and distinct specific status of *Tropidolaemus huttoni*. The occurrence of *Tropidolaemus huttoni* in southern India therefore extends considerably westwards the range of the genus *Tropidolaemus*, previously regarded as typically Indo-Malayan and limited northwards (and westwards) to the Phang-Nga Province of Thailand (Pauwels *et al.* 2000), namely 2,400 airline kilometres across the Bay of Bengal and many more following the mainland.

Biogeographical implications

There is really no possibility for an erroneous type locality of *Tropidolaemus huttoni*. The puzzling occurrence of this Indo-Malayan genus in South India was discussed by David and Vogel (1998). However, there are other reptile genera that show similar distributional pattern, occurring both in Southeast Asia (Indo-China, West Malaysia and the Indo-Malayan Archipelago), and southern India and Sri Lanka, with an apparent distributional gap in Myanmar and most of Peninsular India. According to Das (1996), there are 42 genera of Indo-Malayan reptiles represented in the Indian region. Some snake genera of southern India with Indo-Malayan affinities have been discussed by Hora and Jayaram (1949),

the most striking examples being the genera *Cylindrophis* and *Chrysopelea*. The latter genus has three Indo-Malayan species and one Sri Lankan endemic, in addition to a widespread species (*Chrysopelea ornata*) with a discontinuous range, being found in eastern India to southern China, southwards to Malaya, with populations in south-western India and Sri Lanka (Welch 1988).

These and other snake genera discussed by Hora and Jayaram (1949) share a common characteristic in being absent from the area between the Indo-Chinese region and southern Peninsular India. Das (1996) showed that the reptile faunas of the Western Ghats and of north-east India were not similar. He concluded that the occurrence of Indo-Malayan elements in the fauna of southern India and Sri Lanka is the remnants of an ancient, much wider distribution of plants and animal groups. The wet mountains of southern India provided then the sole refuge to many Indo-Malayan forest-dweller elements, now absent from the dry adjacent lowlands, when the Indian climate and flora dramatically changed following the Eocene with a recession of tropical evergreen forests and their replacement by dry savannas. Indian populations would be relictual, being ecologically trapped, and would have evolved independently from original Indo-Malayan taxa. The presence suggested by Das (1996) of a more widespread distribution of species than now fits well with the presence of *Tropidolaemus* in India.

Interestingly, Blatter (1929) recorded 26 species of mosses, of which one was previously only found in Ceylon (now Sri Lanka), and two previously known from Ceylon and West Malaysia.

A better knowledge of the distribution of *Tropidolaemus huttoni* through further collections would throw light on the zoogeography of the genus. Unfortunately, one has to wait

for additional, adult specimens of this species, which still remain unknown.

A BIOGEOGRAPHICAL ANALYSIS OF THE SNAKE FAUNA OF THE MEGHAMALAI HILLS

We compare in Table 9 the known snake fauna of the Meghamalai Hills with the faunas of three other mountain ranges of South India. Two are located farther north, the Anaimalai Hills, which belong to the same system of mountain ranges, and the Nilgiri Hills in the Western Ghats. The third range, the Cardamom Hills, is located south of the Meghamalai Hills. References are given in Table 9. It should however be understood that the faunas of these two latter ranges are much better known than the fauna of the High Wavy Mountains. So this comparison should be considered to be preliminary at best.

It might be surprising to have a higher percentage of species inhabiting the Meghamalai Hills shared with the Nilgiri Hills, a distant range separated from the southern system of hills and plateau by the Palghat gap. In contrast, the nearby Anaimalai Hills have the lowest number of shared species. These figures seem especially to suggest a lack of systematic collecting in the Anaimalai and the Cardamom Hills.

The Meghamalai Hills constitute a rather isolated spur of highlands along the south-eastern edge of the Kamban Valley figures, but do not seem to host a peculiar reptilian fauna with the exception of *Tropidolaemus huttoni* and the second known specimen of the Skink *Dasia subcaerulea*.

CONCLUSION

As explained above, this survey is highly preliminary. The strictly restricted access of the Tea estates covering much

Table 9: Comparison between the snake fauna of three South Indian ranges

Species	Meghamalai Hills	Anaimalai Hills	Nilgiri Mts.	Cardamom Hills	Sources
Uropeltidae					
<i>Melanophidium punctatum</i>	x	x		x	Smith (1943); Murthy (1990); Whitaker & Captain (2004)
<i>Plecturus perroteti</i>	x	x	x		Smith (1943); Murthy (1990); Whitaker & Captain (2004)
<i>Rhinophis sanguineus</i>	x		x	x	Smith (1943); Murthy (1990)
<i>Rhinophis travancoricus</i>	x			x	Smith (1943); Murthy (1990)
<i>Uropeltis arcticeps</i>	x			x	Smith (1943); Murthy (1990); Whitaker & Captain (2004)
<i>Uropeltis ceylanicus</i>	x	x	x	x	Smith (1943); Rajendran (1985); Murthy (1990); this work
<i>Uropeltis ellioti</i>	x			x	Smith (1943); Murthy (1990)
<i>Uropeltis pulneyensis</i>	x			x	Smith (1943); Murthy (1990)
<i>Uropeltis rubromaculatus</i>	x	x	x		Smith (1943); Murthy (1990)
<i>Uropeltis woodmasoni</i>	x	x	x	x	Smith (1943); Murthy (1990)

SNAKES OF THE HIGH WAVY MOUNTAINS, SOUTH INDIA

Table 9: Comparison between the snake fauna of three South Indian ranges (contd.)

Species	Meghamalai Hills	Anaimalai Hills	Nilgiri Mts.	Cardamom Hills	Sources
Pythonidae					
<i>Python molurus</i>	x	x	x	x	Whitaker & Captain (2004)
Colubridae					
<i>Ahaetulla dispar</i>	x	x	x	x	Smith (1943); Murthy (1990); Whitaker & Captain (2004)
<i>Ahaetulla perroteti</i>	x		x		Smith (1943); Murthy (1990)
<i>Ahaetulla pulverulenta</i>	x		x	x	Smith (1943); Murthy (1990)
<i>Argyrogena fasciolata</i>	x	x			Murthy (1990)
<i>Boiga ceylonensis</i>	x		x		Murthy (1990); Whitaker & Captain (2004); this work
<i>Coelognatus helena</i>	x	x	x	x	Murthy (1990); Whitaker & Captain (2004); this work
<i>Dryocalamus nympa</i>	x		x	x	Hutton (1949a); Whitaker & Captain (2004)
<i>Lycodon striatus</i>	x	x	x	x	Whitaker & Captain (2004)
<i>Lycodon travancoricus</i>	x	x	x	x	Smith (1943); Murthy (1990); Whitaker & Captain (2004)
<i>Oligodon brevicauda</i>	x	x	x	x	Smith (1943); Murthy (1990)
<i>Oligodon taeniolatus</i>	x		x		Smith (1943); Murthy (1990); Whitaker & Captain (2004)
<i>Oligodon travancoricus</i>	x		x	x	Smith (1943); Murthy (1990)
<i>Oligodon venustus</i>	x	x	x	x	Smith (1943); Murthy (1990); this work
<i>Ptyas mucosa</i>	x	x	x		This work
Natricidae					
<i>Amphiesma beddomei</i>	x	x	x	x	Smith (1943); Murthy (1990); Whitaker & Captain (2004); this work
<i>Amphiesma stolatum</i>	x	x	x	x	Smith (1943); Murthy (2001)
<i>Atretium schistosum</i>	x	x	x		Smith (1943); Whitaker & Captain (2004)
<i>Macropisthodon plumbicolor</i>	x		x		Smith (1943); Murthy (2001); this work
<i>Xenochrophis piscator</i>	x	x	x	x	Smith (1943); Murthy (2001); PD's unpublished data
Xenodermatidae					
<i>Xylophis perroteti</i>	x		x	x	Murthy (1990); Whitaker & Captain (2004)
Elapidae					
<i>Calliophis nigrescens</i>	x	x	x	x	Smith (1943); Murthy (1990)
<i>Naja naja</i>	x	x	x	x	Murthy (1990); Whitaker & Captain (2004)
<i>Ophiophagus hannah</i>	x	x	x	x	Smith (1943); Whitaker & Captain (2004)
Viperidae					
<i>Daboia russelii</i>	x	x	x	x	Smith (1943); Whitaker & Captain (2004)
<i>Trimeresurus gramineus</i>	x	x	x		Wall (1919); Pope & Pope (1933)
<i>Trimeresurus macrolepis</i>	x	x	x	x	Smith (1943); Murthy (1990)
<i>Trimeresurus malabaricus</i>	x	x	x	x	Smith (1943); Murthy (1990); Whitaker & Captain (2004)
<i>Tropidolaemus huttoni</i>	x			-	This work
TOTAL	39	25	32	28	
% of the High Wavy fauna	—	64.1	82.1	71.8	

of the Meghamalai Hills does not make it easy for any herpetological investigations in this area. Yet this isolated system of high hills seems to host remnants of undisturbed forests, thanks to the principle of conserving tracts of undisturbed forests for the largest mammals as surveyed by the first author when the Tea estates were being planned.

The survey of these tracts in the protected areas included in restricted tea estates might bring to light new data on the relationships of the herpetological faunas inhabiting the hilly systems of southern India.

Numerous questions have yet to be resolved, the most puzzling of it being the presence in this area of members of the Indo-Malayan fauna (David and Vogel 1998), especially of a pitviper of which nearly nothing is known exactly 60 years after its discovery by the first author. Although covered with tea plantations, this area is still very rich in flora and fauna.

Elephants, Sambar, Barking Deer, Nilgiri Thar, and Gaur are numerous. Recently, the very rare Fruit Bat *Latidens*

salimalii Thonglongya, 1972, discovered in 1947 by the first author of this paper, and listed in the 1995 Guinness Book of Records as the world's rarest bat, has been rediscovered (Muni 1994) in this area.

It should be a matter of time, opportunity and chance to rediscover *Tropidolaemus huttoni*.

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SNAKES OF THE HIGH WAVY MOUNTAINS, SOUTH INDIA

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